

Capítulo 16

Asian dairy markets: a focus on production, consumption and trade

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Introduction

In this chapter we discuss Asian dairy markets with particular focus on China, India, Japan, and South Korea (Korea). These markets represent the majority of the Asian population and are important to world dairy production, consumption and trade. The main body of this chapter consists of three sections that focus on dairy production, consumption, and international trade, respectively. The first highlights Asia as a leading milk producing region accounting for 34 percent of global production. The second section highlights the importance of Asia to global consumption where dairy consumption in Asian countries is increasing at rates that exceed world averages. Finally, we discuss Asian dairy trade and the importance of multilateral and bilateral trade agreements to global dairy markets.

Milk production in Asia

According to the Food and Agricultural Organization (FAO), Asia replaced Europe as the world's largest milk production region in 2006 accounting

for 34 percent of global output. Milk production growth rates of around 5 percent per year were largely driven by increasing demand for milk and dairy products and strong economic growth. Within the Asian region, China's output has increased more than five-fold at an average growth rate of nearly 20 percent since 1998. During the same period, India, the world largest milk producing country, grew by an average of nearly 4 percent and Korea grew by an average of one percent. Milk output growth in Japan has slowed and has grown by only 0.7 percent in the last decade. Milk production in these Asian countries is primarily used for fluid milk and remaining supplies are used mainly in processed products such as cheese, dry milk powder, and butter. Curd and dairy-based sweets are also major processed products in India.

Milk production in selected countries

Japan's commercial dairy farming spans over a century, but its expansion began in the mid 1950s. By 1970, total annual raw milk production in Japan was about 4.76 million metric tons (MT) and expanded 37 percent to 6.50 million MT by 1980 (see Table 1). Rapid growth in raw milk output continued into the mid-1990s and by 1997 had topped out at 8.66 million MT. Since 1997, raw milk output in Japan has declined to 7.99 million MT in 2008. In 1970, the milking cow population in Japan was 885,000 head and by 1980 it had expanded by 21 percent to 1.07 million head (see Table 2). For the next two decades, the milking cow population remained fairly stable and began a slow decline by 2000. By 2008, the cow population was 862,000 head, nearly 3 percent below the 1970 level.

Despite stable-to-declining cow numbers, Japan has been able to maintain very high milk yields by increasing cow productivity. In 1970, output per cow in Japan was 5.38 metric tons (see Fig. 1). It has increase steadily since, and by 2008 stood at 9.27 metric tons. Improvements in milk yields could be attributed to good breeding and feeding programs launched during the 1970s and 1980s (Isogai et al., 1993).

Like Japan, Korea has a mature dairy industry though its commercial dairy production began at a much later date and on a much smaller scale. Commercial dairy production began around 1962 when South Korean government sponsored dairy cow imports. By 1970, the industry produced 52,000 MT of

raw milk (see Table 1). Since, the industry has grown rapidly and produced 2.5 million MT of raw milk in 2002. Recently, production has slightly declined and in 2008 stood at 2.2 million MT. Some of the earlier growth in raw milk output could be attributed to the rapid increase in dairy cow numbers. In 1970, the number of cows stood at 13,000 head and increased rapidly until the mid 1990s. By 1995, there were 318,000 head. Since, the number of milking cows declined to 232,000 head in 2008.

Table 1. Raw cow milk production in selected Asian countries (1,000 MT).

Year	Japan		Korea		China		India	
	Vol.	% change	Vol.	% change	Vol.	% change	Vol.	% change
1970	4,761	–	52	–	400	–	8,736	–
1980	6,504	37	452	769	1,141	185	10,752	23
1985	7,380	13	1006	123	2,499	119	13,255	23
1990	8,189	11	1,752	74	4,157	66	17,500	32
1995	8,382	2	1,998	14	5,764	39	26,715	53
1996	8,657	3	2,034	2	6,294	9	27,916	4
1997	8,645	0	1,984	–2	6,011	–4	29,128	4
1998	8,572	–1	2,027	2	6,629	10	30,454	5
1999	8,460	–1	2,244	11	7,176	8	32,636	7
2000	8,497	0	2,253	0	8,274	15	32,967	1
2001	8,301	–2	2,339	4	10,255	24	34,516	5
2002	8,385	1	2,537	8	12,998	27	34,612	0
2003	8,400	0	2,366	–7	17,463	34	34,973	1
2004	8,329	–1	2,255	–5	22,606	29	37,344	7
2005	8,285	–1	2,229	–1	27,534	22	39,759	6
2006	8,134	–2	2,184	–2	32,800	19	41,000	3
2007	8,007	–2	2,140	–2	38,100	16	42,890	5
2008	7,990	0	2,200	3	36,700	–4	44,100	3
2009*	8,010	0	2,222	1	38,630	5	45,140	2

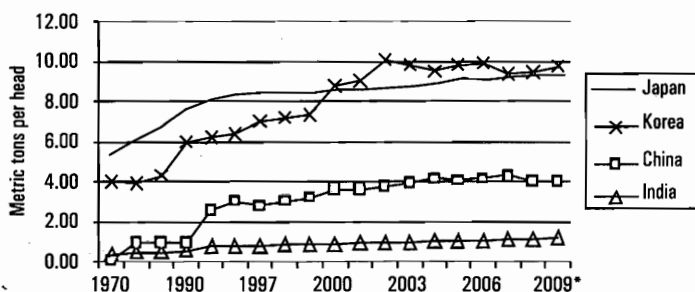
Sources: Compiled and calculated by author from USDA-FAS PS&D and FAOSTAT database. *2009 are forecasts.

Much of the increase in Korean milk output is due to rapid increases in productivity. Production per cow has more than doubled from its 1980 lows and has hovered at or near 10 MT per head since 2002. The Korean dairy industry has also benefited from scale efficiencies with herd size expanding rapidly from under 10 cows per farm in the mid 1985 to more than 50 cows per farm in 2008.

Table 2. Milking cow population and yield in selected Asian nations.

Year	Number of milking cows (1,000 head)				Yield (MT/head)			
	Japan	Korea	China	India	Japan	Korea	China	India
1970	885	13	3,216	21,800	5.38	4.00	0.12	0.40
1980	1,070	114	1,141	24,100	6.08	3.96	1.00	0.45
1985	1,101	231	2,499	27,700	6.70	4.35	1.00	0.48
1990	1,081	292	4,157	32,100	7.58	6.00	1.00	0.55
1995	1,034	318	2,252	33,000	8.11	6.28	2.56	0.81
1996	1,035	316	2,071	33,500	8.36	6.44	3.04	0.83
1997	1,032	281	2,120	34,500	8.38	7.06	2.84	0.84
1998	1,022	281	2,170	35,000	8.39	7.21	3.05	0.87
1999	1,008	306	2,220	35,500	8.39	7.33	3.23	0.92
2000	992	255	2,280	35,750	8.57	8.84	3.63	0.92
2001	971	258	2,848	35,900	8.55	9.07	3.60	0.96
2002	966	252	3,420	36,000	8.68	10.07	3.80	0.96
2003	964	241	4,466	36,500	8.71	9.82	3.91	0.96
2004	936	237	5,466	37,000	8.90	9.51	4.14	1.01
2005	910	227	6,800	38,000	9.10	9.82	4.05	1.05
2006	900	220	7,900	38,000	9.04	9.93	4.15	1.08
2007	871	229	8,755	38,000	9.19	9.34	4.35	1.13
2008	862	232	9,200	38,500	9.27	9.48	3.99	1.15
2009*	865	227	9,660	38,500	9.26	9.79	4.00	1.17

Sources: Compiled and calculated by author from USDA-FAS PS&D and FAOSTAT database. *2009 are forecasts.

**Fig. 1.** Milk yield per cow in selected Asian countries.

Sources: Compiled and calculated by author from USDA-FSA PS&D and FAOSTAT database. *2009 are forecasts.

China has seen rapid growth in its dairy industry. Raw milk output totaled 400,000 MT in 1970 and by 1980 had increased to 1.14 million MT, a 185 percent increase. Since, raw milk output has grown in almost every year by double digit rates before declining by 4 percent in 2008 due to a decline in sales and lower stock prices after the melamine-contaminated milk scandal. Total milk production was 36.70 million MT in 2008, with an average of 3.99 MT per head and milking cow numbers totaling 9.20 million head. The major source of milk production growth in China has been the expansion of the dairy herd. In 1980, there were only 1.1 million dairy cows in China. Between 1980 and 2008, China's dairy cow herd grew at almost the same annual rate as milk production. By 2008, there were 9.20 million dairy cows in China.

Compared to Japan and Korea, productivity per cow in China is relatively low. In 1980, average productivity per cow was just about one metric ton per head. Though increasing steadily since and reaching 4.00 metric tons per head in 2008, it is still less than half the productivity of Japan and Korea. It must be noted that the commercial dairy sector is not as mature as Japan and Korea and as a result is constantly changing. There are wide variations in milk production technologies, ranging from farmers in remote, mountainous villages with one or two dairy cows to state-of-the-art dairy operations with hundreds of cows. Output per cow at some of the modern state-of-the-art operations is comparable to Japan and Korea, but there is a confluence of animals in the lower-producing rural areas.

Since 1970, India's milk production has grown by an average of nearly four percent per year and in 2006 became that largest milk producing country in the world¹. Raw cow-milk output has increased from 8.74 million MT in 1970 to 44.1 million MT in 2008 (see Table 1). The number of milking cows has also nearly doubled during this same period. In 1970, there were 21.8 million milking cattle and by 2008, this increased to 38.5 million head (see Table 2). Productivity per cow has been low and has not increased at the same rate as in other major dairy-producing Asian countries. In 1970, milk production per cow was 0.40 metric tons per head, and by 2008, had improved to 1.15 metric tons per head, almost equivalent to the 1980 productivity levels of China and well below the 1970 productivity levels of Japan and Korea (see Fig. 1).

¹ The bulk of India's milk production—about 61 million metric tons or 57 percent of total milk—is buffalo milk, not cow milk. Buffalo milk is used interchangeably with cow milk in fluid and form with buffalo milk favored for many uses because of its higher butter fat content—typically about 6 percent.

Milk production uses

The milk produced in Asian countries is primarily used for domestic consumption. The proportion of fluid milk use to total raw milk production has been relatively constant in each of the four countries since mid-1990s, accounting for about 55 percent in Japan, 75 percent in Korea, and 40 percent in China and India (see Fig. 2). The remaining milk is manufactured into products such as cheese, dry milk powder, and butter. Less than one percent of raw milk production was used for feed in both China and Japan (see Fig. 2).

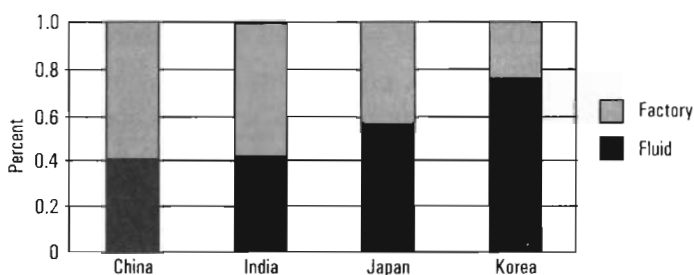


Fig. 2. Uses of milk produced in selected Asian countries, 2008.

Sources: Compiled and calculated by author from USDA-FSA PS&D and FAOSTAT database. * 2009 are forecasts.

Table 3 presents the production of major manufactured dairy products produced in the selected Asian countries. During the period 1995 through 2008, production of non-fat dry milk powder (NFDM) and butter in Japan have declined while cheese production has nearly doubled from 30,000 to 55,000 metric tons. Non-fat dry milk and cheese production in Korea were basically constant, while NFDM and WFDM (whole fat dry milk) in China, and NFDM and butter in India increased significantly.

Policies driving milk production in Asian countries

Government support has been important to the growth and development of dairy industries in Asian countries. Most of them have been heavily protected by direct or indirect support by their government. In Japan and Korea especially, milk production has been boosted by extensive government support programs and economic growth (Dong, 2006).

Table 3. Production of milk products in selected Asia countries (1,000 MT).

Year	Japan			Korea		China		India	
	NFDM	Butter	Cheese	NFDM	Cheese	NFDM	WFD	NFDM	Butter
1995	190	80	30	13	n.a	35	317	100	1,300
1996	200	86	33	31	n.a	36	322	105	1,400
1997	200	87	34	29	n.a	40	350	110	1,470
1998	202	89	35	18	10	42	369	120	1,600
1999	192	86	35	8	14	48	450	130	1,750
2000	194	88	34	24	15	58	522	150	1,950
2001	175	80	34	22	20	70	610	175	2,250
2002	183	83	36	35	21	72	577	185	2,400
2003	183	80	35	26	23	83	750	200	2,450
2004	183	80	35	25	24	68	832	235	2,600
2005	187	84	39	24	24	60	918	256	2,749
2006	180	80	40	18	28	55	1,030	295	3,050
2007	173	75	43	22	24	58	1,150	320	3,360
2008	170	73	55	23	26	60	1,200	345	3,695
2009*	175	75	60	22	27	63	1,270	370	4,065

Sources: Compiled and calculated by author from USDA-FSA PS&D and FAOSTAT database. *2009 are forecasts.

Dairy policies in Japan emphasize self-sufficiency in milk and dairy product production through milk supply controls and direct producer income support. There are two milk markets for milk—one for drinking milk and one for manufacturing milk. The quantity of fluid milk is set by a national board of designated milk producers (non-governmental) and allocated to regional members who voluntarily accept their quota and face penalties if they exceed it. Quota participation is voluntary. For manufacturing milk, government-set production quotas are allocated to farmers who choose to participate. Farmers receive direct payments for milk produced within their quota and no government payment for milk produced over their quota. The direct payment system replaced a deficiency payment system in 2001. Prior to 2001, the voluntary supply control program was protected by price supports for milk used for manufactured dairy products (Suzuki and Kaiser, 2005). Japan introduced an income stabilization program for milk producers in 2001 to reduce the effects of falling dairy prices. The Agriculture and Livestock Industries Corporation, a state trading enterprise, is authorized to stabilize dairy product prices by market intervention and stockpiling when necessary (Obara et al., 2005). Although some policies were changed in 2001, the changes have been basi-

cally recognized as cosmetic rather than fundamental, and milk production in Japan is still encouraged by its isolation from world milk markets because of high protection although non-tariff barriers on dairy products were eliminated under the Uruguay Round Agreement on Agriculture (URAA) (Campo and Beghin, 2005).

South Korea's dairy production is heavily supported by the government. From 1971 to the mid-1980s, the Korean government implemented an Integrated Dairy Development Project which was aimed at expanding production by providing financial support to farmers and establishing dairy processing facilities. Government support also included a variety of high tariffs, tariff rate quotas, and domestic support measures. Reference prices for purchasing raw milk from farmers were set well above the competitive market prices guaranteeing a positive net margin for dairy producers (Lee et al., 2006). Since the end of the 1990s, price-based protection measures have partially changed by redirecting the government's role in administering domestic dairy policy, introducing formal marketing quotas, and reducing the price of above-quota production. The government set price system has never been significantly changed in nature (Lee et al., 2006).

China's dairy policies are promulgated at all levels of government. The central government aims to promote the development of the rural economy and improve the incomes of the rural population through technical support and financial subsidies. These policies are geared toward improving dairy farming, farm management, and raw milk quality. At the same time the regional governments tend to focus on the development of the regional economies in the short term. These policies are aimed at highlighting regional comparative advantages through initiatives like the dairy genetics improvement plan to improve cow genetics through the use of embryo transplants, the new "Grassland Law of the People's Republic of China" which was amended and implemented to highlight the government's increasing concern over the degradation of grassland in major pastoral regions and aims to bring about a sustainable dairy production environment in the future, and the deregulation of the dairy pricing system and the animal husbandry sector. The series of deregulations in the pricing system and the livestock sector conducted during the 1980s resulted in the removal of the strictly controlled dairy pricing system that occurred during the planned-economy period. Once removed, dairy product prices in China became responsive to market forces (Yang et al., 2004).

The expansion of the Indian dairy industry was achieved through extensive intervention by the Indian government in cooperative development for small-scale producers, processors and for a national rail-based network for distributing fluid milk surpluses around the country. India has a number of farmer-oriented dairy policies that are designed to protect dairy cooperatives from lower priced dairy imports. Until 1991, the Indian dairy industry was highly regulated and protected. The Milk Manufacturing and Procurement Order classed dairy processing and manufacturing as a small-scale industry and restricted the industry to small firms and cooperatives. High import duties, non-tariff barriers, restrictions on exports, and stringent licensing provisions provided incentives to Indian-owned small enterprises and cooperatives to expand production in a protected market environment. By 1993, milk was ranked as the most important rural product in India (Aneja, 1994). The development of the dairy industry was seen by Indian policy makers as a measure to create supplementary employment and income for small and marginal farming households and landless wage earners (Government of India, 1994). India has progressively decreased the support and protection of its dairy producers unilaterally, although commitments under the Doha round of the World Trade Organization have helped as well (Rakotoarisoa and Gulati, 2006).

Milk consumption in Asia

The consumption of animal protein, which includes dairy products, is directly related to national income. The significant economic growth experienced in Asian countries has resulted in a substantial increase in dairy product consumption where consumer demand appears to be more responsive to income rather than prices (Beghin, 2006). Given strong economic and population growth, urbanization, increase demand for relatively high value foods, and the westernization of diets, dairy demand in Asia has been expanding; however, compared to western countries, per capita consumption is still relatively low. Dong (2006) notes that average per capita dairy consumption in the last decade was 10.2 kg in China, 71.8 kg in India, 97.6 kg in Japan, and 80 kg in South Korea. These rates are significantly lower than per capita consumption in the EU (330 kg), Australia (310 kg) and the United States (251 kg).

According to the Food and Agriculture Organization (FAO), dairy consumption (all milk products) in East Asia (the Far East² and Japan) was 142.5 million MT in 2003, which was about 28 percent of total world consumption (515.8 million MT) that year. This was a significant increase over the previous year (2002) where total consumption for East Asia and the world was 133.8 and 502.4 million MT, respectively.

The growth in East Asian dairy consumption has exceeded world growth for over a decade. From 1990 to 2003, dairy consumption in East Asia grew by about 4 percent annually while world consumption grew by 2 percent, and since 1993, East Asian consumption grew by 72 percent while world consumption grew by 25 percent (Table 4). This growth has primarily been driven by increases in per capita consumption, particularly in the Far East countries where dairy consumption per capita has increased by about 50 percent since 1993.

Table 4. Total dairy consumption in east Asia and the world.

Year	East Asia	World	East Asia	World
	(Million metric tons)		Annual change	
1990	82.9	412.9		
1991	85.2	409.7	3%	-1%
1992	89.0	407.6	4%	-1%
1993	91.9	414.0	3%	2%
1994	96.6	425.7	5%	3%
1995	102.1	439.1	6%	3%
1996	107.1	448.5	5%	2%
1997	111.3	454.0	4%	1%
1998	114.0	463.9	2%	2%
1999	120.3	474.9	6%	2%
2000	123.6	480.7	3%	1%
2001	128.0	489.7	4%	2%
2002	133.8	502.4	5%	3%
2003	142.5	515.8	7%	3%
	Average annual growth		4%	2%
	Growth since 1990		72%	25%

Source: FAO Statistics.

² The Far East is a FAO geographic grouping containing the following countries: Brunei Darussalam, Cambodia, China, India, Indonesia, Korea, Democratic People's Republic of Korea, Republic of Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Timor-Leste, and Viet Nam.

Dairy consumption in China, India, Japan and Korea

International dairy demand is significantly influenced by income and population growth. This is particularly true for Asia which includes major economies China, India, Japan and South Korea. In 2006, nominal GDP (\$US) for each of these countries were \$7.3, \$2.6, \$4.4 and \$0.9 trillion, respectively. In terms of individual income, GDP per capita was highest in Japan and Korea (\$34,300 and \$18,400, respectively) and lowest in China and India (\$2,012 and \$978, respectively). Economic growth was relatively low in Japan at about 2 percent in recent years (since 2002); however, economic growth in India and China has been strong at 7 to 10 percent, and growth in Korea has been over 5 percent (EconStats, 2009).

In terms of population, China and India are the largest countries in the world and both are significantly larger than Japan and Korea. In 2006, population estimates for China and India were 1.3 and 1.1 billion, respectively, while estimates for Japan and Korea were 128 and 48 million, respectively (EconStats, 2009).

China is a dynamic economy with rapidly changing taste. In recent years, rising incomes, greater ownership of refrigerators and freezers, exposure to international cuisines and broader supermarket ranges has resulted in increased milk and milk product consumption making the dairy sector one of the fastest growing food and drink sectors. The Chinese have significantly changed their dietary habits from starch based to more protein based and regard dairy products as nutritious, protein rich, and high in calcium (USDA-FAS, 2008a).

Dairy consumption in China has doubled in value since 1999 accounting for an increasing share of total food expenditures. For instance, the share of food expenditures allocated to dairy products increased from 2.6 percent in 1999 to 3.1 percent in 2005. In 2006, total dairy consumption reached 19 million MT and projections suggest that consumption in 2008 could surpass 25 million MT making total dairy consumption in China comparable to EU countries such as France and Germany. On a per capita basis, however, dairy consumption in China is still relatively low at 42 grams per day, significantly lower than the world average (270 grams) and the average for all of Asia (140 grams) (KPMG, 2008).

Of the countries highlighted in this chapter, China is a major consumer of both fluid milk and non-fat dry milk (NFD). In 2008, Chinese fluid milk con-

sumption was 15.3 million MT which represented a 3.2 percent increase over the previous year and a phenomenal 301 percent increase since 2000. Fluid milk consumption in 2009 is projected to increase by 4.4 percent. In 2008, Chinese NFDM consumption was 112,000 MT. This was a 19 percent increase when compared to the previous year; however, consumption actually decreased by 19 percent in 2007. Since 2000, NFDM consumption increased from 80,000 MT to current levels and is projected to increase by 13.4 percent to 127,000 MT in 2009 (Table 5).

India is one of the largest milk consuming countries in the world with per capita consumption of milk at 245 grams per day (2007). Indian consumers prefer fresh fluid milk and milk products, such as fresh cheese and yogurts, given their belief that pasteurization decreases the nutritional value of milk. However, with rising incomes and improving lifestyles, the demand for branded products is gaining momentum (USDA-FAS, 2007).

In 2008, fluid milk consumption was 43.9 million MT which was greater than total consumption for all of North America (35.5 million) and the EU-27 (33.6 million). This was a 2.8 percent increase over the previous year (42.7 million) and a 33 percent increase since 2000 (33 million). On average, fluid milk consumption in India has grown by 3.54 percent per year on average since 2000 and is projected to increase even further to 45 million MT in 2009 (Table 5).

Of the countries highlighted in this chapter, India is the only one in which milk has been a traditional part of the diet throughout history. India is also the largest consumer of non-fat dry milk (NFDM) and butter. Nonfat dry milk powder consumption is large in India because they have "flush" and "lean" seasons for production so, as part of the national milk supply grid, they produce NFDM during the "flush" season and reconstitute it during the "lean" season. In 2008, NFDM consumption was 307,000 MT and projected to increase to 337,000 MT in 2009. From 2000 to 2008, Indian consumption of NFDM increased by 98 percent or 9.33 percent per year, on average. In 2008, butter consumption in India was 3.7 million MT. This was more than all of North America and the EU-27 combined. Since 2000, butter consumption has increased by 8.5 percent per year on average and is projected to increase even more so in 2009 to over 4 million MT (Table 5).

Although well established, compared to western countries the dairy industry is relatively new in Japan. Milk and dairy did not enter into the diets

until the 1920s and not to any great extent until after World War II (Simpson, 1993). However, milk is now a regular staple food that is consumed by 87 percent of all Japanese households, and is consumed by persons of all ages and genders. Before WWII, Japan had a rice-dominated diet. After WWII, meat and dairy consumption increased. The changes were due to the more westernized diet in Japan and the increasing awareness of the health benefits of milk consumption. Daily per capita consumption of milk and milk products has grown faster than any other staple food in Japan; however, when compared to European countries and the United States, per capita consumption is still relatively low (Zhang et al., 2003).

Table 5. Dairy consumption by product and country.

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008(p)	2009(f)
Fluid milk (1,000 metric tons)										
China	3,813	4,463	5,678	7,661	10,315	12,500	13,809	14,820	15,300	15,966
India	33,000	33,300	33,500	34,000	35,500	36,600	39,920	42,680	43,885	45,035
Japan	4,971	4,941	5,002	5,035	4,955	4,775	4,648	4,521	4,450	4,400
Cheese (1,000 metric tons)										
Japan	239	236	240	229	254	251	247	268	260	270
Korea	43	52	51	58	65	69	72	74	78	82
Non-fat dry milk (1,000 metric tons)										
China	80	88	107	133	127	115	116	94	112	127
India	155	182	195	186	230	225	245	270	307	337
Japan	235	207	223	211	189	197	200	204	185	190
Korea	21	30	34	35	31	30	28	25	26	26
Butter (1,000 metric tons)										
India	1,958	2,251	2,399	2,449	2,608	2,743	3,055	3,360	3,687	4,062
Japan	84	92	88	89	88	86	89	92	85	85

Source: USDA, Foreign Agricultural Service, Dairy: World markets and Trade.

(p) preliminary; (f) projection.

Although the Japanese consume a significant amount of fluid milk, consumption appears to be leveling and in fact has been declining in recent years. Since 2000, fluid milk consumption decreased from about 5 million MT to about 4.5 million MT in 2008, a decrease of 10 percent. Consumption is projected to decrease even more so in 2009 by 1.1 percent. Although consumption has been declining, compared to China, per capita fluid milk

consumption is still relatively high. Note that the population of Japan is about one-tenth the size of China; however, fluid milk consumption in Japan is about 28 percent of Chinese consumption.

Like Japan, traditional diets in Korea did not include dairy products, but as the younger population increased in size, there has been a greater preference for western style food resulting in increased dairy product consumption. Over the last 30 years, rising incomes and living standard have increased the demand for milk. Additionally, the Korean government initiated financial support for schools in 1980 and the military in 1982 to stimulate demand. The school milk program accounted for 13 percent of total fluid milk consumption annually, and this source of demand played an important role in milk production and consumption over the past two decades (Zhang et al., 2003).

Compare to the other countries, dairy consumption in Korea is low. This has more to do with the relative small population in Korea (48 million) when compared to the other countries. Koreans consumed 1.5 million MT of fluid milk in 2005 and in 2006. This is about 33 percent of total Japanese consumption, 10 percent of total Chinese consumption, and about 3.5 percent of total Indian consumption. Note that the Korean population is about 37 percent of the Japanese population which suggests that per capita fluid milk consumption is about the same in Korea and Japan. The Korean population is only about 3.6 percent and 4.4 percent the population in China and India, respectively. Although total fluid milk consumption in Korea is significantly less than India and China, per capita consumption is still relatively high when compared to these two countries.

In Korea, there has been growing concerns about health and obesity which has resulted in increased preferences for reduced-fat milk products such as fat-free and skimmed milk. These products have experienced the highest growth in sales in recent years. Consequently, whole milk sales have decreased and sales of fat-free fresh milk increased by 15 percent in 2007 (USDA-FAS, 2008b).

Dairy trade in Asian markets

Since 1994, agricultural trade policies have been shaped by the rules laid out in the Uruguay Round Agreement on Agriculture (URAA) reached under the multilateral trade negotiations that created the World Trade Organization

(WTO). Following the signing of the agreement, countries had up to 10 years (developed countries had 6 years) to implement what had been committed to under the URAA. Of the Asian countries examined here, China was not a WTO member in 1994 but did join in 2001. One of the goals of the URAA was to make trade policies more transparent. In the case of milk and dairy products, what had been a system of policies where non-tariff trade barriers created disagreements, tariffs or tariff-based regulations, commonly called tariff rate quotas (TRQ) were implemented.

Implementation of URAA rules across countries did not follow a particular script. The differences in the implemented milk and dairy trade policies reflect the underlying domestic structure of dairy industries, the public policies that affect them and the supply and demand for milk and dairy products. The relatively static situation regarding the Doha Round of WTO has kept dairy trade policies unchanged. However, domestic and global events have been far from static. Our presentation of current dairy trade policy is organized by country.

China

As noted previously, China became a member of the WTO in 2001. But, significant agricultural reforms had been underway since the late 1970s. In the decade prior to 2001, tariffs on agricultural products had been declining and other non-tariff trade activities were being changed to reduce their effects. Upon joining the WTO, the reformed domestic economic policies and open trade regime of China were “locked in” (Lohmar et al., 2009). The major policies applied to agricultural products are applied tariffs, tariff rate quotas (TRQ), imposing value added taxes on imports, some state trading, and licensing.

Since China is a net importing country for milk and dairy products (on a milk equivalent basis), the trade policy instruments of most interest are on the import side. Milk and dairy product imports are subject to applied tariffs (with no quantity conditions). Those tariff rates are at the WTO bound levels. The limited exports of dairy products that China has been making were severely disrupted in 2008 by the detection of melamine in some milk and dairy products, particularly infant formula.

China has established regional and bilateral trade relationships in addition to its inclusion in the WTO. The country is a party to the Asia-Pacific Trade

Agreement and the ASEAN—China Free Trade Area (FTA) framework. Two agreements were reached with ASEAN that went into force in 2005. Bilateral FTAs have been concluded with Chile (2005), Pakistan (2006), and New Zealand (2008). Bilateral negotiations are in process with Australia, Iceland, Peru, Singapore, and the Arab States of the Gulf Cooperation Council. Exploratory talks are underway with India and Korea with a view toward concluding FTAs. While such negotiations cover all sectors, the inclusion of several major dairy product exporters such as New Zealand and Australia suggest some discussions specifically related to dairy trade will be considered.

India

The Government of India has expressed a strong commitment to WTO multilateral trade negotiation efforts but has a roster of widely varying agricultural trade policies. Included on that roster are applied tariffs, tariff rate quotas, outright prohibitions, state trading, and monitoring. Monitoring provides the Indian government latitude to adjust tariffs relatively quickly depending on domestic market situations.

Unlike the other countries examined here, India is a net milk exporting country. The import policy instrument most used for milk and dairy products is applied tariffs. However, a TRQ for skim milk powder was established in 2000. The applied tariff rates are relatively high and it would appear that these tariff rates could be adjusted quite quickly as milk and dairy products are included in those imports subject to monitoring. A more important policy restriction is the requirements that imported dairy products satisfy sanitary conditions established by the Government of India. India has also made use of bans, most recently a short (3 month) ban on imports of milk and milk products from China beginning in September 2008 as a precautionary measure after the findings of melamine adulteration in Chinese milk powder.

Exports of dairy products from India are generally small although the high international prices in marketing years 2006 and 2007 did lead to increased exports of some specific products. Facing rising domestic milk powder prices, an export ban on certain products including milk powder was imposed in February 2007. After lifting the ban, rising food prices prompted the Indian government to remove dairy products from a WTO-legal program of subsidies permitted for products destined for export.

Strong support for the WTO has not prevented India from pursuing regional or bilateral free trade agreements. Most of the agreements are focused on the countries and organizations of Asia and the Pacific. Beginning with Sri Lanka (2000), other bilateral agreements have been reached with Bangladesh, Nepal, Singapore and Thailand. Discussions related to the South Asia Free Trade Area, the Asia Pacific Trade Agreement, the Association of South East Asian Nations (ASEAN), and the European Union (EU) are under way.

Japan

Milk production in Japan is allocated to the fluid market through an industry association and to the manufactured products markets by various policy and regulatory actions. Dairy trade policies are designed to mitigate the effects of imports on domestic milk produced for manufacturing and by extension, the manufactured product markets. Tariffs and tariff-rate quotas are the two major trade policy instruments employed by Japan as established under WTO commitments. The tariffs, which do not have associated quantity restrictions, are applied primarily to products that enter the country for consumption: certain cheeses, frozen yogurt, ice cream, and whipped cream in pressurized containers.

Tariff-rate quotas have been implemented for those products that enter Japan for further processing or as ingredients or are for use by the Agriculture and Livestock Industries Corporation (ALIC), a state trading enterprise. The in-quota tariffs range from 0% to 35 percent and over quota rates from 25 to over 500 percent in ad valorem terms. The wide range in the over-quota rates is indicative of the desire to strictly control entry of certain dairy products into the country. The national goal of self-sufficiency in milk and dairy products in the country has helped define the products most heavily restricted.

There are also WTO-negotiated safeguards the Government of Japan has initiated at various times. These safeguards may be triggered by either quantity or price situations. In either case, the safeguards permit temporary increases in tariffs that are reasonably well defined.

Korea

As in Japan, dairy trade policy in Korea is focused on manufactured products, which are easier to transport from foreign producers than fluid milk is.

A FAS report in 2008 indicated 96 percent of milk consumption in terms of product weight was in the combined categories of fluid and fermented milk products (about 75 percent in milk equivalents). In 1998 the percentage was even higher. Any increases in consumption of other products such as cheese or ice cream are satisfied by imported products. The key imported products are cheese, whey powder, nonfat dry milk, whole-fat dry milk, mixed milk products, butter, and ice cream.

Tariff rate quotas are in place for nonfat and whole-fat dry milks, butter, and whey powder; tariffs are applied to the other three. The TRQ structure for all but whey powder is one of relatively low in-quota quantity and tariff rate with very high over-quota tariffs. The difference for whey is that the in-quota quantity is high, in fact it is anywhere from 50 to 100 times larger than the other product in-quota quantities. The in-quota tariff rate is low, and the over quota tariff is high but not as extreme as in the other cases. Whey is an important import for use in animal feeds.

Korea is not as active in developing multi-and bilateral free trade agreements as other countries. Korea's first bilateral free trade agreement, with Chile, was implemented April 1, 2004. This agreement focused mainly on horticultural products. The dairy TRQs associated with the Korea-U.S. Free Trade Agreement are expected to double the amount of current U.S. imports after ratification.

Dairy trade of selected Asian countries

As the review of trade policies indicates, most of the countries, and indeed most of the remaining Asian countries, are primarily importers of dairy products. The exception in more recent years is India. The following tables show the imports and, to the extent that they exist, exports of selected products: cheese, dry milk powders, butter, and whey products among them. The data is compiled from the World Trade Atlas for HS 4-digit codes that are defined in each table. Empty cells are indicative of missing data. Quantities have been shown since, and this is only a supposition, that when traders are in the international markets they are attempting to locate and obtain desired supplies of products first. Then the prices of available supplies are evaluated. Examining quantities also avoids the issues surrounding exchange rates and defining a common value of trade for comparisons.

It is the dry products, HS codes 0404, 0405, and 0406, where the largest quantities of imports are noted. This is indicative of the country's emphasis on using domestically produced milk mainly for the fluid products while manufactured products are imported to meet changing consumer demands that arise. Only Japan has implemented policies or programs to provide incentives to develop a larger manufactured product base and those efforts have focused on cheese (See Tables 6-9).

Table 6. Dairy exports and imports by product: China.

Product/HS Code*	2004	2005	2006	2007	2008
Exports (kilograms)					
0401	30,640,323	33,590,416	38,622,195	45,559,020	38,427,892
0402	26,692,674	33,844,593	34,000,652	76,874,966	71,825,443
0403	768,551	1,031,354	1,060,821	1,664,906	1,103,821
0404	1,440,681	635,239	536,905	4,066,346	4,309,966
0405	23,850	64,560	138,985	5,928,882	4,966,558
0406	551,763	658,247	540,260	471,645	
Imports (kilograms)					
0401	3,006,042	3,829,343	3,818,513	4,109,233	7,534,998
0402	145,906,781	108,029,504	136,046,100	99,096,094	101,783,184
0403	492,017	497,178	783,786	720,531	784,960
0404	177,987,256	188,006,043	184,505,104	167,583,981	213,506,396
0405	12,379,395	12,834,895	12,781,224	14,002,146	13,553,398
0406	7,244,109	7,177,701	9,891,997	13,190,020	13,904,353
Net imports (kilograms) (imports minus exports)					
0401	-7,634,281	-29,761,073	-34,803,682	-41,449,787	-30,892,894
0402	119,214,107	74,184,911	102,045,448	22,221,128	29,957,741
0403	-276,534	-534,176	-277,035	-944,375	-318,861
0404	176,546,575	187,370,804	183,968,199	163,517,635	209,196,430
0405	12,355,545	12,770,335	12,642,239	8,073,264	8,586,840
0406	6,692,346	6,519,454	9,351,737	12,718,375	

*** Product description:**

0401 – Milk, cream not sweetened or condensed

0402 – Milk, cream concentrated or sweetened

0403 – Buttermilk, Yogurt, etc.

0404 – Whey, other milk products

0405 – Butter, oils from milk

0406 – Cheese and curd

Source: World Trade Atlas Import-Export data.

Table 7. Dairy exports and imports by product: India.

Product/HS Code*	2004	2005	2006	2007	2008
Exports (kilograms)					
0401	389,932	1,980,718	4,032,367	6,949,208	
0402	19,138,752	64,338,840	42,343,623	33,196,872	
0403	59,496	138,885	595,478	3,198,784	
0404	1,044,789	2,178,585	1,206,463	6,556,800	
0405	2,793,162	6,183,609	5,418,840	6,404,240	
0406	220,362	952,941	806,800	1,457,712	
Imports (kilograms)					
0401	203,319		16,522	21,077	
0402	1,455,808	685,118	537,099	930,674	
0403	89,002	80,812	121,264	133,965	
0404	1,826,809	1,076,370	1,806,066	1,322,683	
0405	3,733,873	1,045,436	8,524,516	1,305,019	
0406	409,789	456,038	603,585	698,303	
Net imports (kilograms) (imports minus exports)					
0401	-186,613		-4,015,845	-6,928,131	
0402	-17,682,944	-63,653,722	-41,806,524	-32,266,198	
0403	29,506	-58,073	-474,214	-3,064,819	
0404	782,020	-1,102,215	599,603	-5,234,117	
0405	940,711	-5,138,173	3,105,676	-5,099,221	
0406	189,427	-496,903	-203,215	-759,409	

*** Product description:**

0401 – Milk, cream not sweetened or condensed

0402 – Milk, cream concentrated or sweetened

0403 – Buttermilk, Yogurt, etc.

0404 – Whey, other milk products

0405 – Butter, oils from milk

0406 – Cheese and curd

Source: World Trade Atlas Import-Export data.

Table 8. Dairy exports and imports by product: Japan.

Product/HS Code*	2004	2005	2006	2007	2008
Exports (kilograms)					
0401	248,568	188,541	282,154	417,212	898,150
0402	221,089	246,294	747,593	2,061,124	1,029,182
0403	32,902	128,920	23,126	90,268	133,283
0404	1,221,585	1,538,395	1,658,412	1,207,241	409,361
0405	125,887	3,703	3,953	46,362	70,681
0406	309,844	319,436	394,761	445,534	289,259
Imports (kilograms)					
0401	12,648	48,826	56,519	25,620	14,921
0402	38,518,365	35,791,284	33,877,625	37,523,653	33,579,478
0403	18,677	8,840	13,116	13,412	97,454
0404	50,495,670	55,585,133	54,757,670	59,570,874	51,849,783
0405	6,587,710	5,540,337	4,625,877	14,452,254	20,050,889
0406	218,679,233	211,691,543	207,419,550	225,081,157	186,497,132
Net imports (kilograms) (imports minus exports)					
0401	-235,920	-139,715	-225,635	-391,592	-883,229
0402	38,297,276	35,544,990	33,130,032	35,462,529	32,550,296
0403	-14,225	-120,080	-10,010	-76,856	-35,829
0404	49,274,085	54,046,738	53,099,258	58,363,633	51,440,422
0405	6,461,823	5,536,634	4,621,924	14,405,892	19,980,208
0406	218,369,389	211,372,107	207,024,789	224,635,623	186,207,873

*** Product description:**

0401 – Milk, cream not sweetened or condensed

0402 – Milk, cream concentrated or sweetened

0403 – Buttermilk, Yogurt, etc.

0404 – Whey, other milk products

0405 – Butter, oils from milk

0406 – Cheese and curd

Source: World Trade Atlas Import-Export data.

Table 9. Dairy exports and imports by product: Korea.

Product/HS Code*	2004	2005	2006	2007	2008
Exports (kilograms)					
0401	83,164	30,720		5,755	282,772
0402	249,635	396,607	312,769	551,295	764,553
0403	6,672,322	6,488,249	6,965,764	5,784,656	4,873,884
0404	80,975	512,011	1,056,444	1,186,641	786,362
0405			21,420	4,220	9
0406	292,726	322,341	229,583	51,938	110,285
Imports (kilograms)					
0401	6,002,316	3,819,482	2,159,421	2,598,047	1,690,764
0402	6,089,784	8,084,319	8,917,637	6,325,905	6,556,054
0403	491,428	103,379	169,111	280,136	182,882
0404	57,504,338	62,649,776	71,729,513	70,419,939	51,327,506
0405	4,055,381	5,046,807	3,205,714	4,095,913	3,091,958
0406	41,350,524	44,032,322	44,032,347	49,470,818	47,384,734
Net imports (kilograms) (imports minus exports)					
0401	5,919,152	3,788,762		2,592,292	1,407,992
0402	5,840,149	7,687,712	8,604,868	5,774,610	5,791,501
0403	-6,180,894	-6,384,870	-6,796,653	-5,504,520	-4,691,002
0404	57,423,363	62,137,765	70,673,069	69,233,298	50,541,144
0405			3,184,294	4,091,693	3,091,949
0406	41,057,798	43,709,981	43,802,764	49,418,880	47,274,449

*** Product description:**

0401 – Milk, cream not sweetened or condensed

0402 – Milk, cream concentrated or sweetened

0403 – Buttermilk, Yogurt, etc.

0404 – Whey, other milk products

0405 – Butter, oils from milk

0406 – Cheese and curd

Source: World Trade Atlas Import-Export data.**Outlook for Asian dairy markets**

The spike dairy prices experienced during the past two years and the on-going financial crisis have taken a toll on import demand. In Asia, the fear of melamine contaminated dairy products has been another factor which will likely contribute to decreased consumption of in dairy products.

In China, economic growth is expected to be 8 percent, while growth in other Asian nations such as Korea is forecast to be below 3 percent. Given

that income is an important determinant of international dairy demand, Asian dairy consumption and imports may decrease in the coming months.

It is notable that Japan and South Korea, which have higher disposable income and are more westernized, have much higher consumption than other Asian countries except

India. Japanese and Korean milk consumption grew rapidly prior to 1990, in concurrence with the strong economic growth and the introduction of school milk programs in both countries. The increase in milk consumption slowed considerably in these countries, and the consumption has recently reached a mature stage. Other Asian countries, which share a number of cultural, agricultural, and dietary habits in common with Japan and Korea, are expected to experience similar changes and increase their dairy consumption as their income grows and dietary preferences shift.

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